

### Trend Study 17-59-05

Study site name: Emma Park .

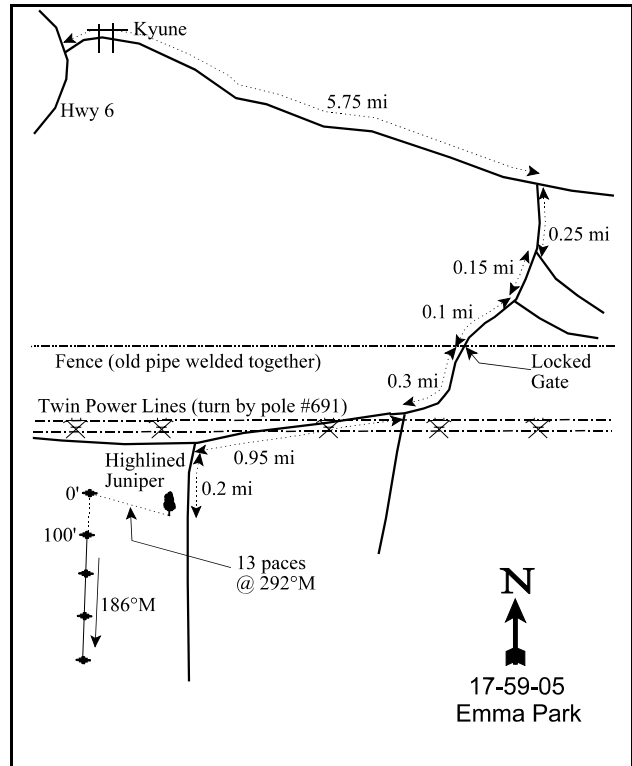
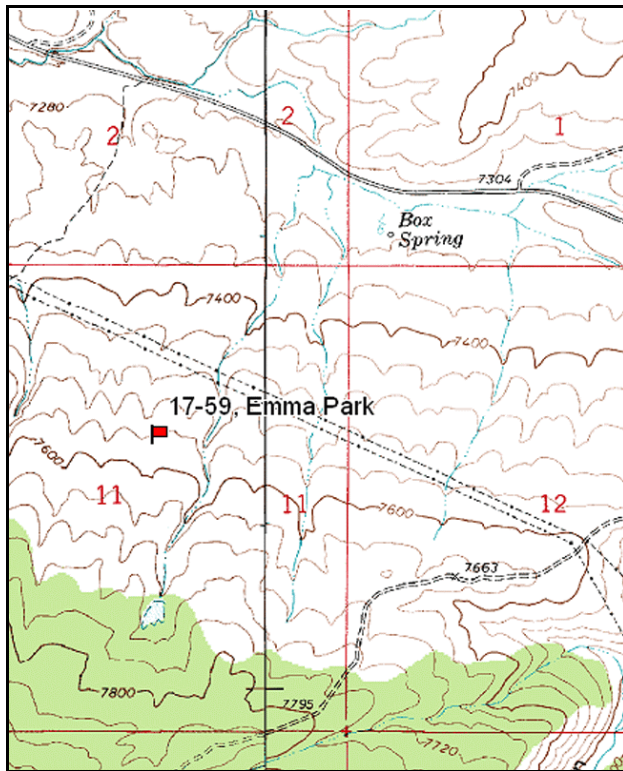
Vegetation type: Mountain Big Sagebrush .

Compass bearing: frequency baseline 186 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

### LOCATION DESCRIPTION

Traveling south on Highway 6 take a left on the road that leads to Kyune and travel 5.75 miles. Turn right and go 0.25 miles. Veer right for 0.15 miles to a fork. Continue right for 0.1 miles to a locked gate. Go through the gate for 0.3 miles. Veer right and go 0.95 miles following the power lines. Turn left for 0.2 miles to a high lined juniper. The 0 foot stake is 13 paces away @ 292°M.



Map Name: Kyune

Diagrammatic Sketch

Township 12S, Range 9E, Section 11

GPS: NAD 27, UTM 12S 4405280 N, 510327 E

## DISCUSSION

### Emma Park - Trend Study No. 17-59

The Emma Park study was established in 1994 and was selected because of the perceived increase of winter use by elk in the area. It is located on one of the many moderately north sloping ridges in the area that drain into Horse Creek, which in turn drains southwest into the Price River. The elevation is about 7,600 feet on an 8% slope and a northwest aspect. It is located within the sagebrush-grass type. Species diversity is very high with about 56 species found on the inventoried transects. Cattle use the area during the summer as part of the Price Canyon East allotment which is used by 108 cattle from May 16 to November 15. Deer appear to be using this area as transitional and summer range. Deer were seen on site during the 2000 reading. Quadrat frequencies of elk (25%) and deer (19%) pellet groups were fairly high in 1994. Perhaps due to the mild winter of 1999-2000, quadrat frequency of elk and deer pellet groups dropped to 6% and 8% during the 2000 reading. Pellet quadrat frequencies in 2005 were 13% elk and 6% deer, higher than 2000, but lower than 1994. Pellet group data read in 2000 were estimated at 13 elk, 15 deer, and 20 cow days use/acre (32 edu/ha, 37 ddu/ha, and 50 cdu/ha). Pellet group data in 2005 were estimated at 24 elk, 11 deer, and 19 cow days use/acre (60 edu/ha, 28 ddu/ha, and 47 cdu/ha).

Soil is moderately deep with an effective rooting depth estimated at just over 14 inches. The soil has a clay loam texture and a neutral soil reaction (pH of 7.0). Small rocks are common on the surface and within the profile in some areas, but the soil is deeper and relatively rock free in other areas. Rocky areas support far fewer and smaller shrubs, while the deeper soil along the end of the baseline supports very large and robust sagebrush. There is little current evidence of erosion, but historically the area exhibits signs of heavy soil loss. The erosion index measurement in 2005 rated the soil erosion as slight, mainly because of moderate frequent pedestaling of the shrubs and perennial grasses, some minor soil movement, moderate litter movement, minor surface rock movement, and minor flow patterns between perennial species.

Mountain big sagebrush is the key browse species. Mountain big sagebrush density was 4,640 plants/acre in 1994, 4,600 in 2000, and 3,820 in 2005. It has provided cover values of 22% in 1994, 19% in 2000, and 13% in 2005. In areas with deeper soil, some of the sagebrush appears to be basin big sagebrush. These plants are very tall and robust with a height of 5 feet and a crown of nearly 4 feet. Most of the sagebrush sampled are considered to be mountain big sagebrush, although there appears to be some hybridizing between the two subspecies. Use of the sagebrush has been mostly light and have had good vigor. The plants with poor vigor increased from 4% of the population in 2000 to 25% in 2005, nearly all of which were classified as dying. Decadence had also been low and reproduction good, but decadence increased from 11% in 2000 to 41% in 2005. The young plants decreased from 17% of the population in 2000 to only 2% in 2005.

Other desirable shrubs include some moderate to heavy browsed serviceberry and a few scattered heavily hedged bitterbrush. Stickyleaf low rabbitbrush and Oregon grape are abundant understory shrubs. They are not utilized and appear to have stable mature populations.

The herbaceous understory is moderately abundant and diverse. It contributed 15% of the cover in 1994, 21% in 2000, and 23% in 2005. Forbs alone contributed 8% cover in 1995, 11% in 2000, and 12% in 2005. The herbaceous species could provide good transition range forage in the fall and spring. Salina wildrye, thickspike wheatgrass, Letterman needlegrass, Kentucky bluegrass, and mutton bluegrass are all fairly abundant. Kentucky bluegrass appeared to be heavily utilized in 2000. Forbs are diverse with several preferred species sampled. The most common species is desert phlox which provided 4% cover in 1994, 5% in 2000, and 6% in 2005. Other abundant forb species include: dandelion, silver lupine, Tolmie owllover, and lobeleaf groundsel.

## 1994 APPARENT TREND ASSESSMENT

The soil appears stable because of excellent vegetation cover, good litter cover, and a low percentage of bare ground. The browse also appears stable with good vigor and productivity. The herbaceous understory is abundant and diverse with good species diversity and excellent cover values. The Desirable Components Index rated this site as good with a score of 68 due to fair perennial grass cover, excellent browse cover, and excellent perennial forb cover.

winter range condition (DC Index) - good (68) Mid-level Potential scale

## 2000 TREND ASSESSMENT

Trend for soil stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground increased, and percent bare soil has increased slightly. However, this is not enough change to warrant a change in trend. Trend for the key browse, mountain big sagebrush is stable. Population density has not changed but the number of decadent plants has declined. Use is mostly light to moderate, vigor is good and reproduction adequate to maintain the stand. Trend for the herbaceous understory is up due to a 21% increase in the sum of nested frequency of grasses and a 31% increase in forbs. A reduction in sagebrush cover would further increase production of the herbaceous understory. The Desirable Components Index rated this site as excellent to good with a score of 80 due to good perennial grass cover, excellent browse cover, and excellent perennial forb cover.

### TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - up (+2)

winter range condition (DC Index) - excellent to good (80) Mid-level Potential scale

## 2005 TREND ASSESSMENT

The trend for soil is slightly down. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground decreased and the percent bare soil increased by 7%. This change is due mainly to a slight decrease in vegetation and litter with and increase in bare ground. The trend for browse is slightly down. The key browse species, mountain big sagebrush, decreased 17% in density. As well, the decadence also increased from 11% to 41%. Recruitment decreased from 17% young in 2000 to 2% in 2005 with an increase in the dying from 4% to 24%. The densities of serviceberry and basin big sage increased, but not enough to compensate for the loss of mountain big sage. The herbaceous understory trend is stable. The sum of the nested frequencies of perennial grasses and perennial forbs increased very slightly, but not enough to change the trend. The Desirable Components Index rated this site as fair with a score of 55 due to fair perennial grass cover, fair browse cover, and excellent perennial forb cover.

### TREND ASSESSMENT

soil - slightly down (-1)

browse - slightly down (-1)

herbaceous understory - stable (0)

winter range condition (DC Index) - fair (55) Mid-level Potential scale

HERBACEOUS TRENDS --

Management unit 17 , Study no: 59

Type	Species	Nested Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
G	Agropyron dasystachyum	a <sup>8</sup>	c <sup>101</sup>	b <sup>48</sup>	.21	1.11	.38
G	Agropyron trachycaulum	a <sup>-</sup>	a <sup>-</sup>	b <sup>14</sup>	-	-	.10
G	Bromus anomalus	6	7	11	.01	.04	.06
G	Bromus tectorum (a)	ab <sup>3</sup>	b <sup>9</sup>	a <sup>-</sup>	.00	.09	.00
G	Carex sp.	a <sup>9</sup>	b <sup>46</sup>	a <sup>20</sup>	.18	.72	.21
G	Elymus salina	b <sup>242</sup>	a <sup>86</sup>	b <sup>207</sup>	5.72	2.36	4.31
G	Koeleria cristata	a <sup>-</sup>	a <sup>1</sup>	b <sup>54</sup>	-	.03	.32
G	Poa fendleriana	b <sup>132</sup>	a <sup>85</sup>	a <sup>41</sup>	.90	1.50	.26
G	Poa pratensis	a <sup>-</sup>	b <sup>111</sup>	b <sup>78</sup>	-	2.58	2.38
G	Poa secunda	a <sup>-</sup>	ab <sup>12</sup>	b <sup>25</sup>	-	.07	.28
G	Stipa columbiana	-	-	4	-	-	.18
G	Stipa lettermani	a <sup>32</sup>	b <sup>70</sup>	a <sup>27</sup>	.28	1.19	.29
Total for Annual Grasses		3	9	0	0.00	0.08	0.00
Total for Perennial Grasses		429	519	529	7.31	9.63	8.80
Total for Grasses		432	528	529	7.32	9.72	8.80
F	Achillea millefolium	a <sup>34</sup>	b <sup>61</sup>	a <sup>24</sup>	.17	.73	.33
F	Agoseris glauca	-	-	3	-	-	.00
F	Allium sp.	-	-	4	-	-	.01
F	Antennaria parvifolia	a <sup>3</sup>	b <sup>23</sup>	b <sup>27</sup>	.06	.32	.20
F	Androsace septentrionalis (a)	a <sup>2</sup>	a <sup>6</sup>	b <sup>46</sup>	.00	.01	.12
F	Arabis drummondi	a <sup>12</sup>	a <sup>3</sup>	b <sup>48</sup>	.03	.00	.14
F	Aster chilensis	33	15	15	.14	.19	.25
F	Astragalus convallarius	b <sup>25</sup>	a <sup>5</sup>	ab <sup>23</sup>	.26	.07	.11
F	Astragalus tenellus	b <sup>60</sup>	b <sup>77</sup>	a <sup>25</sup>	1.14	.57	.11
F	Astragalus sp.	9	-	9	.06	-	.07
F	Astragalus utahensis	a <sup>-</sup>	ab <sup>6</sup>	b <sup>12</sup>	-	.07	.05
F	Castilleja linariaefolia	7	3	5	.16	.00	.04
F	Calochortus nuttallii	a <sup>3</sup>	a <sup>-</sup>	b <sup>26</sup>	.00	-	.07
F	Chenopodium album (a)	1	-	1	.00	-	.00
F	Chaenactis douglasii	7	6	2	.01	.05	.00
F	Cirsium sp.	-	2	-	-	.00	-
F	Comandra pallida	a <sup>14</sup>	b <sup>39</sup>	ab <sup>20</sup>	.03	.25	.08
F	Collinsia parviflora (a)	b <sup>44</sup>	a <sup>-</sup>	a <sup>5</sup>	.19	-	.01
F	Crepis acuminata	ab <sup>3</sup>	a <sup>-</sup>	b <sup>8</sup>	.41	-	.05
F	Erigeron eatonii	b <sup>65</sup>	a <sup>34</sup>	b <sup>72</sup>	.42	.14	.26

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
F	Erigeron flagellaris	<sub>a</sub> 1	<sub>a</sub> 4	<sub>b</sub> 22	.00	.01	.14
F	Eriogonum umbellatum	3	4	4	.03	.06	.15
F	Gayophytum ramosissimum(a)	3	2	-	.00	.00	-
F	Gilia sp. (a)	2	-	-	.01	-	-
F	Hedysarum boreale	-	3	1	-	.03	.03
F	Helianthella uniflora	<sub>a</sub> 1	<sub>b</sub> 24	<sub>a</sub> 3	.00	.37	.41
F	Ipomopsis aggregata	-	2	5	-	.00	.03
F	Lomatium sp.	-	2	-	-	.00	-
F	Lupinus argenteus	35	35	23	.21	.59	1.14
F	Lychnis drummondii	1	6	-	.00	.41	-
F	Machaeranthera canescens	5	-	9	.01	-	.05
F	Orthocarpus tolmiei (a)	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 110	-	.00	1.21
F	Penstemon caespitosus	13	24	6	.07	.19	.01
F	Penstemon humilis	11	13	-	.10	.04	-
F	Penstemon watsonii	23	19	7	.41	.20	.23
F	Phlox austromontana	<sub>a</sub> 142	<sub>ab</sub> 156	<sub>b</sub> 199	3.72	5.16	6.25
F	Phlox longifolia	3	1	3	.00	.00	.00
F	Polygonum douglasii (a)	<sub>b</sub> 10	<sub>a</sub> -	<sub>ab</sub> 5	.02	-	.02
F	Potentilla gracilis	<sub>a</sub> 4	<sub>a</sub> 11	<sub>b</sub> 25	.01	.08	.09
F	Schoenocrambe linifolia	2	2	3	.00	.01	.03
F	Senecio integerrimus	9	8	6	.03	.07	.04
F	Senecio multilobatus	<sub>a</sub> 15	<sub>b</sub> 103	<sub>b</sub> 77	.04	1.37	.55
F	Sphaeralcea coccinea	3	-	-	.00	-	-
F	Taraxacum officinale	<sub>a</sub> 6	<sub>a</sub> 31	<sub>b</sub> 42	.01	.18	1.23
F	Thalictrum fendleri	3	8	3	.06	.06	.15
F	Zigadenus paniculatus	1	-	9	.00	-	.03
Total for Annual Forbs		62	9	167	0.24	0.02	1.37
Total for Perennial Forbs		556	730	770	7.70	11.31	12.43
Total for Forbs		618	739	937	7.94	11.34	13.80

Values with different subscript letters are significantly different at alpha = 0.10

## BROWSE TRENDS --

Management unit 17 , Study no: 59

Type	Species	Strip Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
B	Amelanchier utahensis	9	8	12	.18	.33	.21
B	Artemisia tridentata tridentata	0	3	11	-	.68	2.20
B	Artemisia tridentata vaseyana	88	93	85	21.89	19.21	12.86
B	Cercocarpus montanus	1	0	0	.03	-	-
B	Chrysothamnus depressus	4	8	14	.19	.27	.45
B	Chrysothamnus viscidiflorus viscidiflorus	74	64	60	3.73	4.61	3.49
B	Gutierrezia sarothrae	3	4	4	.00	.03	.03
B	Mahonia repens	22	23	15	.65	1.06	.85
B	Purshia tridentata	0	1	1	-	-	-
B	Ribes sp.	0	1	0	-	-	-
B	Rosa woodsii	3	3	0	.00	.03	-
B	Symphoricarpos oreophilus	28	24	7	2.66	2.14	.24
B	Tetradymia canescens	1	2	2	-	.00	-
Total for Browse		233	234	211	29.34	28.37	20.36

## CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 59

Species	Percent Cover
	'05
Amelanchier utahensis	.91
Artemisia tridentata tridentata	4.51
Artemisia tridentata vaseyana	17.75
Chrysothamnus depressus	.53
Chrysothamnus viscidiflorus viscidiflorus	5.33
Gutierrezia sarothrae	.01
Mahonia repens	.30
Purshia tridentata	.08
Symphoricarpos oreophilus	.48
Tetradymia canescens	.08

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 17 , Study no: 59

Species	Average leader growth (in)
	'05
Artemisia tridentata vaseyana	1.6
Purshia tridentata	4.0

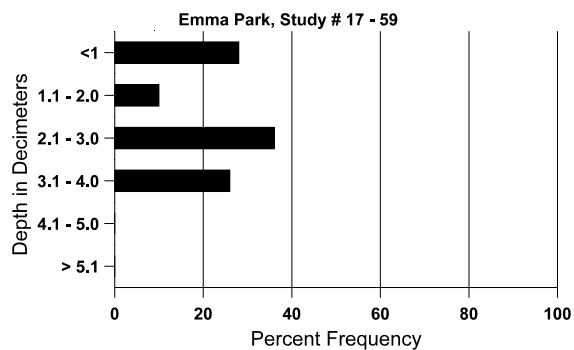
BASIC COVER --  
Management unit 17 , Study no: 59

Cover Type	Average Cover %		
	'94	'00	'05
Vegetation	43.04	50.81	37.15
Rock	5.51	6.91	4.99
Pavement	1.48	7.57	4.17
Litter	47.61	59.09	41.79
Cryptogams	.60	1.20	.35
Bare Ground	14.02	18.48	21.44

SOIL ANALYSIS DATA --  
Herd Unit 17, Study # 59, Study Name: Emma Park

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
14.4	49.2 (14.9)	7.0	29.4	31.1	39.3	4.0	10.6	137.6	0.8

## Stoniness Index



PELLET GROUP DATA --

Management unit 17 , Study no: 59

Type	Quadrat Frequency			Days use per acre (ha)	
	'94	'00	'05	'00	'05
Rabbit	16	24	10	-	-
Moose	2	2	-	-	-
Elk	25	6	13	13 (31)	24 (60)
Deer	19	8	6	15 (36)	11 (28)
Cattle	6	2	3	20 (50)	19 (47)

BROWSE CHARACTERISTICS --

Management unit 17 , Study no: 59

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
94	<b>200</b>	-	20	140	40	20	10	40	20	-	20	16/11
00	<b>200</b>	-	100	80	20	-	40	10	10	10	30	15/17
05	<b>260</b>	20	60	180	20	-	38	54	8	-	0	15/17
Artemisia tridentata tridentata												
94	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
00	<b>60</b>	-	-	60	-	-	0	0	0	-	0	61/45
05	<b>380</b>	-	-	320	60	80	21	11	16	5	5	58/54
Artemisia tridentata vaseyana												
94	<b>4640</b>	40	520	2980	1140	720	8	1	25	5	5	28/34
00	<b>4600</b>	80	780	3300	520	580	17	0	11	4	4	28/35
05	<b>3820</b>	-	80	2180	1560	1040	28	7	41	24	25	24/31
Cercocarpus montanus												
94	<b>20</b>	-	-	20	-	-	100	0	-	-	100	9/12
00	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
05	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus depressus												
94	<b>180</b>	-	-	180	-	-	11	0	0	-	0	4/10
00	<b>300</b>	-	-	300	-	-	7	0	0	-	0	3/7
05	<b>880</b>	-	-	840	40	-	18	0	5	5	5	6/12
Chrysothamnus viscidiflorus viscidiflorus												
94	<b>4800</b>	-	-	4760	40	-	0	0	1	.41	.83	11/13
00	<b>4000</b>	-	140	3720	140	-	.50	0	4	.50	.50	9/13
05	<b>3540</b>	80	-	3460	80	40	0	0	2	-	1	11/18



		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Gutierrezia sarothrae</i>												
94	<b>120</b>	-	40	80	-	-	0	0	-	-	0	6/9
00	<b>240</b>	-	-	240	-	-	0	0	-	-	0	4/7
05	<b>260</b>	-	-	260	-	-	0	0	-	-	0	6/10
<i>Mahonia repens</i>												
94	<b>4260</b>	-	700	3560	-	-	0	0	-	-	0	3/4
00	<b>6380</b>	-	980	5400	-	-	0	0	-	-	0	3/4
05	<b>1180</b>	-	-	1180	-	-	0	0	-	-	0	2/3
<i>Purshia tridentata</i>												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	17/30
00	<b>40</b>	-	-	40	-	20	0	100	-	-	0	20/50
05	<b>40</b>	-	-	40	-	-	0	100	-	-	0	-/-
<i>Ribes</i> sp.												
94	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
00	<b>20</b>	-	20	-	-	-	0	0	-	-	0	-/-
05	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Rosa woodsii</i>												
94	<b>140</b>	-	-	140	-	-	0	0	-	-	0	7/7
00	<b>80</b>	-	40	40	-	-	0	0	-	-	0	19/8
05	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
<i>Symphoricarpos oreophilus</i>												
94	<b>1420</b>	-	120	1280	20	-	6	1	1	-	0	18/25
00	<b>920</b>	-	180	740	-	-	2	0	0	-	2	15/17
05	<b>200</b>	-	-	100	100	-	0	0	50	50	50	23/24
<i>Tetradymia canescens</i>												
94	<b>40</b>	-	-	-	40	-	100	0	100	100	100	4/4
00	<b>80</b>	-	40	40	-	-	0	0	0	-	0	-/-
05	<b>60</b>	-	-	60	-	-	0	0	0	-	0	6/10